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Services Growth in India: A Look Inside the Black Box

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1. Introduction

It is now widely recognized that the pattern of growth in India in recent years has been an unconventional one. Virtually all labor-abundant developing countries such as Taiwan, South Korea and China saw the shares of labor-intensive manufacturing in the GDP and employment rise and those of agriculture fall during their high-growth phases. In contrast, during its recent high-growth phase, India has witnessed the share of labor-intensive manufacturing in the GDP stagnate despite a declining share of agriculture. Moreover, the movement of workers out of agriculture has been extremely piecemeal, with shifts in the relative employment shares barely visible.

To be sure, economic reforms including opening to trade and foreign investment and freeing up of domestic controls have helped improve the performance of both industry and services. In particular, capital-intensive manufacturing sectors such as automobiles, auto parts, and petroleum refining and skilled-labor intensive service sectors such as the software industry, telecommunications, pharmaceuticals and banking and finance have grown very rapidly during the high-growth phase. These sectors have been impacted directly by increased openness to one or more of trade, foreign investment and domestic entry conditions.

Nevertheless, there remain at least two anomalies. Despite de-licensing of investment and massive trade and foreign investment liberalization, unskilled-labor-intensive manufactures such as apparel, footwear and light consumer goods in which India has a clear comparative advantage have failed to emerge as leading exports. For instance, India's share in the U.S. apparel market remains about the same as that of much smaller Bangladesh. Second, by all accounts, services have taken off across the board.

Even many non-traded services that have no apparent direct link to either external opening or internal deregulation have shown almost as much dynamism as their traded and foreign-invested counterparts.

As regards the first anomaly, the poor performance of labor-intensive manufacturing until recently was to be attributed to the policy of small-scale industries (SSI) reservation. This policy required virtually all labor-intensive manufactures to be produced exclusively by small enterprises whose total investment remained capped initially below $100,000 and later $250,000. This left the labor-intensive manufactures in India populated by very small enterprises, largely catering to highly localized markets. Smallness of the enterprises combined with the absence of foreign competition due to prohibitive trade barriers also resulted in poor product quality.

Though the SSI reservation was effectively eliminated and international trade considerably liberalized by the early 2000s, truly large-scale firms in the labor-intensive sectors such as apparel and footwear have not emerged. In all likelihood, the reason for this is the existence of another regulation that has come to bind subsequent to the effective relaxation of the SSI reservation: stringent labor laws that asymmetrically punish large-scale manufacturing firms in labor-intensive sectors. With labor costs accounting for less than 10 percent of the total costs, large firms in the capital-intensive sectors such as automobile are able to absorb the costs of stringent labor laws without undue impact on profitability. In contrast, in sectors such as apparel in which labor costs

could be as high as 80 percent of the total costs, the extra cost of satisfying these laws renders large-scale operation unprofitable.[1]

Because most labor laws applicable to larger enterprises were originally written with the intent to protect the rights of factory workers, large-scale services sector enterprises escaped them. For example, the virtual ban on firing workers by firms with 100 workers or more under the Industrial Disputes Act, 1948 applies only to units engaged in manufacturing activity. Other labor laws that frequently bring labor department inspectors to the doorsteps of the firms are also aimed principally at manufacturing units. As a result services have had a much freer and competitive environment in the domestic economy in general.

This brings us to the second anomaly noted above. Given the generally free environment, why did the non-traded services with no direct link to either external opening or internal deregulation did not grow rapidly? Our conjecture is that despite a domestically competitive environment, until the reforms, growth in these services remained constrained by two key factors.

First, low growth in the traded goods and services kept the demand for non-traded services low. Many non-traded services are bought by enterprises in traded sectors so that the growth in the latter has a direct bearing on the growth of the former. Equally, the demand for non-traded services bought by individuals depends on the level of expenditures incurred by them. For example, demands for passenger travel,

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[1] To give just one example, the Industrial Dispute Act, 1948 makes it virtually impossible for a manufacturing firm with 100 or more employees to legally fire the workers under any circumstances. Even if the firm goes bankrupt, it must pay the workers their regular salary. Capital-intensive firms get around this law by giving overly generous packages to workers they want to layoff. Because labor costs are a small proportion of the total costs, these firms can afford to pay such golden shake hands. The same option is not available in sectors where 80 percent or more of the cost is accounted for by labor.

telecommunications, fax and courier services, tourism, restaurant food, real estate activity, beauty parlors, medical, nursing and veterinary services and garbage collection rise with consumer expenditures. Low growth in the economy in general means low growth in the demand for these non-traded services as well.

The second reason why non-traded services did not takeoff prior to the reforms is that the efficiency of production crucially depends on the availability of quality tools and equipment. For example, the information technology industry needs access to state of the art hardware and software. Similarly, firms in the transport sector need access to high-quality cars, buses and trucks. Taxi services cannot grow without access to good quality cars in the necessary quantities. Courier services require good quality motorcycles and other means of transportation. Travel agencies, stock brokers and independent accounts need computers and access to the Internet. Even small shops providing phone, fax and photo copying services require proper equipment that provides high-quality output without frequent breakdowns. Those in communications industry need telephones, fax machines and computers. Those engaged in repair jobs need top-quality tools. Restrictions on international trade and domestic economic activity greatly limited the access to top-quality tools and equipment in adequate quantities with adverse effects on productivity.

Prior to the reforms, the non-traded services sector in India operated like a subsistence economy in the 19th century in the sense that it had large volumes of underutilized labor. Workers were hired because they were needed for certain tasks but were underemployed due to either insufficient demand or unavailability of proper equipment. The slack in labor use was perhaps even more pronounced in the self-

employed enterprises. Our key hypothesis is that the reforms helped release both constraints. Growth in the traded goods and services increased the demand for non-traded services directly as well as through increased incomes. The external and internal deregulation also opened the door to the state of the art equipment in adequate volume through imports as well as improved quality of domestic output. For instance, high-quality automobiles, buses, trucks, motorcycles, computers, cell phones and equipment of all kind are more plentifully available today than in the pre-reform era. Increased demand allowed fuller use of the workers' time while the availability of high-quality equipment helped raise the efficiency of the work performed. Both factors contributed to productivity growth.

To-date, formal analyses of economic reforms in India using detailed enterprise level data have remained confined principally to manufacturing. Scientific analyses of services, mainly by Poonam Gupta with various co-authors, have relied exclusively on sectoral data provided by the National Accounts Statistics.[2] While this is a good starting point to begin to understand the growth and transformation under way in India in services, it is extremely limiting. Firms providing services vary considerably in size ranging from those that employ no workers to very large ones with thousands of workers. They also vary considerable in the ownership structure ranging from proprietorship to cooperative to corporate. To understand the sources of growth impulses, we clearly need to study services at the level of the firm.

Until recently, data at the level of the firm in services sectors that would allow analysis over time were not available. Such data have recently become available,

[2] See Gordon and Gupta (2004) and Eichengreen and Gupta (2010).

however. The National Sample Survey Organization (NSSO) of the Central Statistical Organization (CSO) has produced two very large surveys covering a substantial subset of services for years 2001-02 (July 1-June 30) and 2006-07. These surveys provide systematic data on 244,376 enterprises in 2001-02 and 189,844 enterprises in 2006-07. The surveys follow a broadly uniform sample design and questionnaire and are therefore comparable. Geographically, the surveys cover the entire India with rural and urban enterprises separately identified. They also distinguish among "on account enterprises (OAE)" that hire no regular workers, those that hire workers but nevertheless remain small and those with a formal corporate structure.

Although India had begun to grow at 5 to 6 percent annual rate in the late 1980s, the shift to the 8-9 percent range took place in fiscal year 2003-04 (April 1-March 31). This latter shift followed the reforms during 1998-2003 under the National Democratic Alliance (NDA). Those reforms were wide-ranging and touched virtually every aspect of the economy except labor laws and higher education. Therefore, the two surveys give us observations from pre- and post-reform eras that also coincide with pre- and post-growth-acceleration periods.

The paper is organized as follows. In Section 2, we describe the broad contours of the two surveys on which this paper is based. In Section 3, we situate the services in general and those covered by the two surveys in particular within the broad context of the economy. In Section 3, we set out the distinction between formal and informal sector firms within the services sectors. In Section 4, we describe the characteristics of enterprises as revealed by the surveys. A key finding here is that while the output is concentrated in larger urban enterprises, more than half od the workforce is employed in

tiny on account enterprises that employ no hired workers on a regular basis. This pattern translates into much higher per worker and per enterprise output in the large enterprises than in the smaller ones. In Section 5, we summarize the pattern of growth across enterprises, states and different service sectors. We show that though growth can be seen in all enterprises, sectors and states, it is heavily concentrated in the largest enterprises, some key services sectors such as communications and business services and some key states such as Maharashtra and Karnataka. Uneven growth that usually characterizes rapid growth across broad sectors and regions of the economy also characterizes the growth within services. In Section 6, we estimate productivity growth. Consistent with our conjecture that the opening up of the economy has led to fuller use of previously underutilized labor, our results here show very substantial growth in productivity. In some states, it reaches as high as 5 percent per year. In Section 7, we test our two hypotheses on why liberalization has resulted in growth even though many of the services sectors have no direct link to it. We find positive evidence for both hypotheses. In Section 8, we conclude the paper.

2. Some Preliminary Observations on the Surveys

To explain the broad contours of the surveys, it is best to begin with an introduction to the National Industrial Classification (NIC) 2004, which serves as the basis of identification of various sectors of the economy in the National Accounts Statistics, which provide the GDP data, as well as National Sample Surveys.[3] This classification initially divides the economy into 17 "Sections" identified by alphabetical letters A, B, …

[3] Concordances are available between earlier classifications and NIC 2004. For example, the 2001-02 services survey employed NIC 1998 classification but it can be readily converted into NIC 2004.

Q. Table 1 lists these sections. On one hand, these sections can be combined into a smaller number of broader sectors while on the other they may be disaggregated into much narrower categories referred to as "Divisions" in the NIC 2004. The broader sectors are frequently called agriculture, industry and services such that agriculture includes sectors A and B, industry sectors C, D, E and F and services sectors G thru Q. The narrower "Divisions" in the classification are defined using two- or higher-digit numerical codes. Appendix Table A.1 exhaustively lists all two-digit divisions within each alphabetical Section.

The 2006-07 survey covered sections H thru O minus L with some narrower divisions within these broad sections excluded. Full listing of the two- or higher-digit divisions covered and a detailed description of the services within each of the latter can be found in NSS (2009, pp. 7-10).[4] Within the divisions covered, the following enterprises were excluded from the survey: (i) All government and public sector enterprises, (ii) Government aided educational institutions defined as institutions in which the entire salary of all teaching and non-teaching staff was borne by the government and (iii) Service enterprises registered under the Factories Act, 1948 and covered by the latest, 2004-05, Annual Survey of Industries frame. The 2001-02 survey covered the same sectors as the 2006-07 survey with two exceptions: (i) It did not cover financial intermediation sector (NIC Section J) and (ii) It covered divisions with codes 601 (non-mechanized transport activities related to transport via railways) of Section I and 911 (community activities of business, employers and professional organizations) of Section

[4] The excluded sub-sector are: transport by railways (NIC 601), transport via pipeline (NIC 603) and air transport (NIC 62) in Section I; monetary transactions (NIC 651) in Section J; and Activities of business, employers and professional organizations (NIC 911), activities of trade unions (NIC 912) and Activities of political organizations (9192) in Section O.

O, which the 2006-07 survey did not cover. Throughout, our analysis excludes Section J to make the two surveys comparable except the minor differences arising out of the exclusion of divisions 601 and 911 in the 2006-07 surveys, which are both tiny.

Table 1: Broad Sectors in National Industrial Classification (NIC) 2004

Section	Description
Agriculture:	
A	Agriculture, hunting and forestry
B	Fishing
Industry:	
C	Mining and quarrying
D	Manufacturing
E	Electricity, gas and water supply
F	Construction
Services:	
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
H	Hotels and restaurants
I	Transport, storage and communications
J	Financial intermediation
K	Real estate, renting and business activities
L	Public administration and defense; compulsory social security
M	Education
N	Health and social work
O	Other community, social and personal service activities
P	Activities of private households as employers and undifferentiated production activities of private households
Q	Extraterritorial organizations and bodies

Source: Ministry of Statistics and Program Implementation

Counting Delhi as a state, the surveys cover all 29 states and 6 UTs in the country.[5] The sample is highly stratified with rural and urban areas clearly distinguished. The first stage units (FSU) are villages in the rural areas and Urban Frame Survey blocks in the urban area. These units are first identified and the ultimate stage units, called enterprises, sampled out of them. Enterprises are divided into two types: own account enterprises (OAE), which do not employ any hired workers on a regular basis, and establishment enterprises that employ one or more hired workers on a regular basis.

One important difference exists between the 2001-02 and 2006-07 surveys. The former treats the very large enterprises no differently than other establishment enterprises. The latter takes the view that this approach results in under representation of the large enterprises, which account for a disproportionately large volume of gross value added and assets. It therefore introduces a separate "list frame" for the largest enterprises in the private corporate sector. It identified 998 big service sector companies distributed all over India for this frame and, allowing for casualties for a variety of reasons, surveys 438 of them.[6] Separate estimates of gross value added and other variables are possible for these large enterprises. This is the only substantive difference in the sample design between 2001-02 and 2006-07 surveys. Its likely effect is to correct for the under representation of the large enterprises in the 2001-02 survey, which may lead to an upward bias in the growth in variables such as gross value added and assets of the establishment enterprises and therefore of the aggregate value added and assets as well.

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[5] The only exclusions are the districts of Leh in Ladakh and Kargil, Punch and Rajauri in Jammu and Kashmir plus some interior villages in Nagaland and Andaman and Nicobar Islands.

[6] The remaining enterprises are dropped for a variety of reasons. In some cases, the enterprises could not be located. In other cases, they turned out to be publicly owned. In yet other cases, the enterprise was registered under the Factories Act 1948.

The 2001-02 survey selected a total of 15,869 first stage units (FSU) of which 41 percent were rural and the remainder urban. Altogether 244,376 enterprises within these FSU were surveyed with 37.85 percent units in the rural areas and 62.15 percent in urban areas. The 2006-07 survey selected 13,271 FSU of which 42 percent were in the rural and 58 percent in the urban areas. It surveyed 189,844 enterprises altogether with 43.82 percent in the rural and 56.18 percent in urban areas. The Union Territory of Lakshadweep accounted for the minimum number of enterprises covered in each survey: 171 in the 2001-02 survey and 187 in the 2006-07 survey. State or Union Territory level estimates of variables such as value added, workers employed and assets are likely to be associated with large standard errors in the cases of small number of enterprises.

Before considering further details of the surveys, it is now useful to situate the services sectors covered by them within the overall economy.

3. Situating the Services Covered by the Surveys within the Economy

Table 2 reports the breakdown of the GDP and employment among three broad sectors of the economy: Agriculture, industry and services. As noted in the previous section, the first of these sectors includes, agriculture, forestry and fisheries (Sections A and B of NIC 2004). Industry is defined to include mining and quarrying; manufacturing; gas electricity and water supply; and construction (Sections C thru F). Services include Sections G thru Q. The data on GDP shares in Table 2 are from the National Accounts Statistics and those on employment from Employment Unemployment Surveys of the National Sample Surveys (NSS).

Recall that the two services firm surveys we propose to analyze in the paper were conducted in 2001-02 and 2006-07. Accordingly, we report the output shares of the three

sectors in these two years and their growth rates over the five-year period in columns 2, 3 and 4 of Table 2, respectively. The Employment Unemployment Survey report is available for 2001-02 but not 2006-07. Therefore, for the latter year, we substitute the employment shares from the survey report relating to the year 2007-08. Accordingly, columns 5 and 6 in Table 1 report the employment shares of various sectors in years 2001-02 and 2007-08.

To give the reader an idea of the approximate relative size of the services covered by our surveys, we report in the fourth row of Table 2 the approximate output and employment shares of these services as reported in the NAS GDP data and NSS employment unemployment survey reports. As previously noted, most but not all NIC divisions and enterprises within these categories are covered by the surveys. In particular, any public sector enterprises including the railways—the largest single employer in the world—are not included in the surveys. Therefore, the true GDP and employment shares of the sectors covered in the surveys are slightly below those reported in the fourth row of Table 2.

Though agriculture and allied activities accounted for just 24 percent of the GDP in 2001-02, they employed 60.8 percent of the workforce. An examination of the shifts in the output and employment shares of agriculture over time shows that the former has evolved much faster than the latter. Migration of workers out of agriculture in India has been painfully slow despite rapid growth.

Industry accounted for a quarter of the GDP but employed only 17 percent of the workforce in 2001-02. Services accounted for 51 percent of the GDP in the same year and employed just 22.1 percent of the workforce. Even at the highly aggregated level in

Table 2, it is evident that on the average services produce higher output per worker than both industry and agriculture. This turns out to be even truer of the services covered by the surveys that are the object of the analysis in this paper. The ratio of output share to employment share in 2001-02 was 2.5 in these latter services. In comparison, the same ratio was 2.3 in services as a whole, 1.5 in industry and 0.4 in agriculture. The services in the fourth row of Table 1 also grew more rapidly than services as a whole between 2001-02 and 2006-07.

Table 2: Shares of Broad Sectors in the GDP and Employment

Sector	Share in GDP (2001-02)	Share in GDP (2006-07)	Growth (2001-02 to 2006-07)	Employment Share (2001-02)	Employment Share (2007-08)
1	2	3	4	5	6
Agriculture and allied activities	24.0	18.5	2.5	60.8	57.3
Industry	25.0	26.7	9.2	17.0	18.7
Services	51.0	54.7	9.3	22.1	24
Services Covered by the Surveys	24.0	27.3	10.6	9.9	11.9
GDP in billion rupees (columns 2 and 3) or Total Workers in million (columns 5 and 6)	19726	28643	7.8	417	408
Absolute number of workers in services covered by the surveys (million)				41	48

Source: Authors' calculations using the data from the CSO and NSS

We may note that the number of workers employed in the sectors covered in the surveys as reported in the surveys themselves are 26.6 million in 2001-02 and 27.7 million in 2006-07. In part, these numbers are smaller than those shown in the last line (columns 5 and 6) of Table 2 because the coverage of the surveys across NIC two- or higher-digit divisions within the covered sections and across enterprises is not exhaustive. But part of the difference may also be due to sampling errors. The coverage of the specific sectors we consider here in the employment unemployment surveys is likely to have been less exhaustive than in the surveys under analysis.

Table 3 provides some details on services in terms of the NIC Sections. The relevant NIC Section code is shown in parentheses following the description of the sector. Several exclusions from the above list in the surveys under analysis may be noted here. First, neither of the surveys includes section G, which represents retail and wholesale trade and repair services for cars, motorcycles and household appliances. This is a sizeable sector in terms of output as well as employment.

Second, as already noted, while the 2006-07 survey covers banking and insurance (Section J), the 2001-02 survey does not do so. Because one of our key objectives is to analyze the change observed between the two surveys, our analysis excludes this sector.

Third, the surveys also exclude NIC categories L, P and Q. Category L, which employed 1.8 percent of the workforce in 2007-08, represents public administration and defense and is a part of the public sector. Category P represents activities of private households as employers and accounted for 0.7 percent of the total employment in 2007-08. This category is clearly a part of private services sector but the surveys do not cover

it. Category Q stands for extraterritorial organizations and bodies and registered zero share in employment in both 2001-02 and 2007-08 employment-unemployment surveys.

Table 3: Detailed Services Sectors

Services Sectors	Share in GDP (2001-02)	Share in GDP (2006-07)	Growth (2001-02 to 2006-07)	Employment Share (2001-02)	Employment Share (2007-08)
Trade and auto & household appliance repair (G)	13.6	13.9	8.3	9.4	8.9
Hotels & restaurants (H)	1.3	1.5	10.5	1.2	1.4
Transport, storage & communication (I)	8.2	11.4	15.3	3.4	4.2
Banking & insurance (J)	5.7	6.7	11.3	0.5	0.7
Real estate, ownership of dwellings & business services (K)	7.5	7.6	8.2	0.6	1.2
Public administration & defense (L)	6.5	5.6	4.7	2.4	1.8
Other services (education, health, other community services etc.) (M, N, O, P and Q)	8.2	8.0	7.1	4.6	5.8
All Services	51.0	54.7	9.3	22.1	24.0
Services included in both surveys (H, I, K, M, N, O with some exclusions)	24.0	27.3	10.6	9.9	11.9

Source: Authors' calculations using the CSO and NSS data.

Finally, railway and air transport (NIC 2004 categories 601 and 62, respectively) and transport via pipelines (NIC 2004 category 603) are also excluded from the surveys. Railways are in the public sector. Air transport contains both private and public sector firms.

4. A Note on Formal Versus Informal Sector Services

Defining the informal sector services is always a challenge. In India, the term informal sector is often identified with the "unorganized" sector. As we explain immediately below, this is not a bad approximation when it comes to manufacturing sector. But the issue is more complex when considering services.

In India, the organized sector typically includes all enterprises and employees in the public sector and firms registered under the Factories Act, 1948. All firms engaged in manufacturing must register under the Act if they employ 10 workers and use power or if they employ 20 workers (regardless of the use of power). This places all private sector manufacturing enterprises with less than 10 workers using power and those with less than 20 workers but not using power in the unorganized sector. For most purposes, we can reasonably identify these enterprises with the informal sector. In principle, it is conceivable that a highly automated large-scale plant escapes registration under the Factories Act, 1948 but it is unlikely in practice.

The problem in services arises from the fact that they are not required to register under the Factories Act, 1948 unless they also happen to be engaged in manufacturing activity. Therefore, most private sector services enterprises, whether small or large, are officially in the unorganized sector. For instance, large private sector banks such as the

ICICI Bank and HDFC Bank and software export giants such as the Infosys, Wipro and Satyam are officially in the unorganized sector.

In carrying out its "unorganized" sector surveys, the NSSO works with this definition. This means that its unorganized services sector surveys include enterprises of all size as long as they are in the private sector. This is true of the two surveys we study. As previously mentioned, the surveys broadly divide enterprises into on account enterprises (OAE) and establishment enterprises with the former referring to enterprises that do not employ any hired worker on a regular basis and the latter to those employing them. While the OAE clearly belong to the informal sector, the establishment enterprises include both informal and formal sector enterprises. In principle, it is possible to identify and exclude all limited liability companies or enterprises with workers exceeding certain threshold to distinguish between formal and informal sector enterprises but there is some arbitrariness in doing so. Therefore, our analysis looks at enterprises by categorizing them by several alternative criteria.

5. Some Basic Characteristics of the Enterprises

We are now in a position to report some basic economic characteristics of the enterprises. The sectors covered by both surveys are estimated to have 15 million enterprises in all, employing 27.75 million workers in 2006-07. The vast majority of the enterprises are tiny and self-owned employing no hired workers on a regular basis. This also means that the majority of workers are employed in these small enterprises. This fact makes it important to study growth and productivity in the small and large enterprises separately.

Table 4: Value added and workers across enterprises and regions (2006-07)

Enterprise Type	Rural	Urban	All India	Rural	Urban	All India
	Value Added (% of Total)			Workers (% of Total)		
OAE	10.8	10.1	20.9	35.8	22.5	58.3
Establishments	7.0	72.1	79.1	12.2	29.6	41.7
Total	17.8	82.2	100.0	48.0	52.0	100.0
	Value Added per Worker (rupees)			Value added per enterprise (rupees)		
OAE	21,390.3	31,820.7	25,410.4	27,235.1	40,623.5	32,386.8
Establishments	40,755.6	172,673.8	134,262.4	161,043.2	969,380.0	671,769.9
Total	26,296.9	111,890.4	70,838.6	40,424.3	254,709.2	131,046.2

Table 4 reports the composition of value added and workers across the OAE and establishment enterprises in rural and urban areas at the national level as per the 2006-07 survey.[7] It also reports the value added per worker and value added per enterprise in the OAE and establishment enterprises in the rural and urban areas in 2006-07. A key observation that jumps out of the table is that the output is heavily concentrated in the urban establishment enterprises (72.1%) while the majority of the workers (58.3%) are in the OAE. This translates into a much higher value added per worker and per enterprise in the urban establishment enterprises relative to the remaining categories.

[7] Value added is defined as the total revenue minus the costs of intermediate inputs and approximately represents the payments to primary factors of production.

In addition to accounting for a large proportion of the output, urban establishment enterprises employ 30 percent of the workers. This makes a careful study of the urban establishment enterprises crucial. At the same time, because the majority of the workers are employed in the OAE, these latter enterprises require a close attention as well. On average, value-added per enterprise is strictly between one to two times the value-added per worker in the OAE. This means that on average there are at most one to two workers per OAE and that in many cases, the owner is the only worker.

Perhaps the most important conclusion that follows from Table 4 is that a very large proportion of the labor force in services remains employed in enterprises with very low average productivity. The transformation problem India faces with respect to the movement of the vast workforce out of agriculture into more productive non-agricultural activities is also present within services. A majority of the workforce within services is in small, informal enterprises with relatively low output per worker. We will see in the next section that the smaller enterprises are also subject to relatively low growth. As such the gap in the average labor productivity is widening rather than narrowing.

We next consider the composition of services output and workers across various NIC Sections. This is done in Table 5, which provides the distribution of value added and workers according to NIC Sections. Because different sectors employ various factors of production in different proportions, it is no surprise that employment and value added do not go hand in hand. While transport, storage and communications (NIC Section I) account for the largest share in employment, real estate, renting and business activities (NIC Section K) generate the larges share in value added. In a similar vein, while the

value added is concentrated in the urban areas in every Section, workers are more even divided between rural an urban areas.

Table 5: Distribution of Value Added and Workers Across Activities (2006-07)

NIC Section	Value Added			Workers		
	Rural	Urban	Total	Rural	Urban	Total
Hotels and restaurants (H)	2.9	11.5	14.5	7.7	10.8	18.5
Transport, storage and communications (I)	7.3	15.1	22.4	17.1	13.1	30.2
Real estate, renting and business activities (K)	1.3	33.3	34.6	3.1	8.1	11.2
Education (M)	2.4	9.7	12.1	5.6	8.4	14.0
Health and social work (N)	1.6	7.7	9.3	3.0	4.8	7.9
Other community, social and personal service activities (O)	2.3	4.9	7.2	11.5	6.8	18.3
Total	17.8	82.2	100.0	48.0	52.0	100.0

Finally, we may note that the shares in value added and workers also vary dramatically across sates and Union Territories (UT). Table 6 reports the shares in value added and workers of various states in all services covered in the 2006-07 survey (including NIC Section J). The states are arranged in order of declining share of value added (with Delhi counted as a state) while the UTs are arranged alphabetically. Strikingly, just two states—Maharashtra and Karnataka—account for as much as 48.57 percent of the value added in the services covered by the 2006-07 survey. This is a remarkable geographical concentration of services output. Partly, this is the result of the heavy concentration of the financial services in Maharashtra and software services in Karnataka. Geographical

distribution of workers is, of course, quite different from the distribution of value added. For instance, Uttar Pradesh, which ranks 8th in value added with just 4.66% share, has the largest share (12.36%) in workers. Top 18 states according to value added account for 94.15 percent of the value added and 95.02 percent of the workers in the services covered by the 2006-07 survey.

Table 6: Shares of States and UTs in the Value Added and Workers (Section J included)

State/UT*	% Share in VA	% Share in Workers	State/UT*	% Share in VA	% Share in Workers
Maharashtra	31.99	9.61	Uttarakhand	0.41	0.75
Karnataka	16.58	4.84	Goa	0.39	0.23
Andhra Pradesh	7.04	11.06	Chhattisgarh	0.38	1.37
West Bengal	6.11	10.10	Himachal Pradesh	0.34	0.66
Tamil Nadu	5.74	8.89	Meghalaya	0.14	0.33
Gujarat	5.09	3.72	Manipur	0.11	0.16
Kerala	4.85	6.61	Tripura	0.09	0.26
Uttar Pradesh	4.66	12.36	Sikkim	0.06	0.07
Rajasthan	2.30	3.61	Nagaland	0.05	0.07
Punjab	1.78	2.43	Mizoram	0.03	0.04
Haryana	1.41	1.74	Arunachal Pradesh	0.02	0.02
Madhya Pradesh	1.24	3.09	A & N Island	0.03	0.03
Bihar	1.18	3.98	Chandigarh	3.62	0.68
Assam	1.13	3.43	D & N Haveli	0.01	0.01
Orissa	0.92	5.85	Daman & Diu	0.02	0.02
Jharkhand	0.83	1.97	Lakshadweep	0.00	0.00
Delhi	0.74	0.98	Puducherry	0.15	0.28
Jammu & Kashmir	0.56	0.74	India	100.00	100.00

6. The Pattern of Growth: 2001-02 to 2006-07

We are now in a position to consider the changes between 2001-02 and 2006-07, which can be partially attributed to the reforms that took place in the late 1990s and early 2000s. Because the surveys provide data on all values at current prices, our first task is to convert them into a common base using appropriate deflators. For this, we use the NAS GDP data, which provide the values of sectoral outputs in various states for each financial year at both current and constant 1999-2000 prices. The current and constant price magnitudes for a given sector in a given state in a given year implicitly define a deflator that converts the current-price magnitude into constant, 1999-2000-price magnitude. This deflator can be used to convert a current-price value in a given sector in a given state in a given year into a corresponding value at constant 1999-2000 prices. Our intention is to follow this procedure, although for now we have implemented it very imperfectly, using the national deflators for all states. Our use of sectoral deflators for now has also been imperfect. Therefore, the actual numbers generated below must be seen as highly tentative.

The first point to note is that the surveys show an extremely high rate of growth in services. In current rupees, the total value added in the services covered by both surveys rose from 747.82 billion rupees in 2001-02 to 2447.92 billion rupees in 2006-07. This amounted to 227.34 percent growth over the five-year period or a compound growth rate of 26.77 percent per year. Once we apply price deflators to convert the nominal magnitudes into real, the two growth rates come down to 171.73 and 22.13 percent, respectively. While our deflator seems approximately in line with the compound rate of increase of 5 percent in the wholesale price index between 2001-02 and 2006-07, it may

be on the lower side. But even if it is assumed to rise at twice the rate implicit in our current calculations, the growth rate in the services will remain well above 15 percent.

We suspect that the source of what appears to us to be an upward bias in the growth rate is the better capture of the output of the large enterprises in the 2006-07 survey relative to that in the 2001-02 survey. Recall that the 2006-07 survey separately created a list frame of the large enterprises and made special effort to survey all of them. The results show that these list frame enterprises account for as much as 38 Percent of the total output even though they account for only 2 percent of the employment in the covered services.[8] It is our view, therefore, that the absolute growth in the services produced by large enterprises and that in the total volume of services are upward biased. This is perhaps not the case with small enterprises.

To give the reader an idea of where the bias due to better coverage of the list frame enterprises in 2006-07 bites most, Table 7 provides details of the distribution of these enterprises across states and between financial and non-financial enterprises. The table lists all states with one or more list frame companies. Of the 438 list frame companies surveyed in all, 168 or 38 percent are in the financial sector and are excluded from our subsequent analysis. Of the remaining 270 companies, 68.5 percent are concentrated in the top four states and another 23 percent in the next four. That is to say, the top eight states account for 91.5 percent of all list frame companies in non-financial sectors. Note may be taken that the top eight states in Tables 6 and 7 are identical. Even the ranking of these eight states in the two tables is remarkably similar.

[8] These figures relate to all sectors covered in the 2006-07 survey including financial services (Section J).

Table 7: Distribution of List Frame Companies

	Total number of list frame companies			Average number of workers per company		
	Financial	Non-financial	All	Financial	Non-financial	All
Maharashtra	95	60	155	540	1876	1057
Karnataka	7	49	56	750	2770	2517
Tamil Nadu	16	40	56	478	185	269
West Bengal	12	36	48	137	1000	784
Andhra Pradesh	7	18	25	1039	2517	2103
Kerala	8	17	25	803	132	347
Gujarat	3	16	19	102	157	148
Uttar Pradesh	5	11	16	330	493	442
Delhi	5	3	8	11	5	9
Haryana	1	4	5	451	2730	2274
Punjab	3	2	5	14	81	41
Madhya Pradesh	3	1	4	25	16	23
Rajasthan	2	2	4	34	5	20
Goa	0	2	2	0	421	421
Himachal Pradesh	0	2	2	0	118	118
Orissa	0	2	2	0	22	22
Assam	1	0	1	141	0	141
Bihar	0	1	1	0	64	64
Chhattisgarh	0	1	1	0	5	5
Jammu & Kashmir	0	1	1	0	1033	1033
Chandigarh	0	1	1	0	55	55
Daman & Diu	0	1	1	0	24	24
All-India	168	270	438	490	1336	1011

The second point to note is that, as previously hinted, there is a large difference between the performances of small versus large enterprises in terms of growth. There are many criteria for distinguishing between small and large enterprises: OAE versus establishment enterprises; enterprises with less than five workers and those with five or more workers; corporate versus non-corporate enterprises; and so on. Except in the case of rural OAE versus establishment enterprises, smaller enterprises consistently show a significantly slower growth than their larger counterparts.

Figure 1 show the growth rates in covered services by enterprise size. In each case, the "list frame" enterprises, which perhaps contribute to an upward bias in the growth rate, are naturally included in the large enterprise category. Therefore, there remains some question about the absolute level of growth of the larger enterprises. What is interesting, however, is that non-list-frame enterprises for which we have no obvious reason to suspect an upward bias also exhibit healthy growth. The urban and rural OAE taken together exhibit an annual growth rate of 4.8 percent. Rural OAE by themselves have grown at 5 percent per year. Both these growth rates are superior to the growth rate in agriculture. What is more interesting, however, is that the growth rate takes a jump as soon as we move out of the OAE. Enterprises with less than five workers have grown 5.9 percent per year nationwide and 12.3 percent per year in urban areas. Since these enterprises also include the OAE, we may infer that non-OAE enterprises with less than five workers grow at significantly higher rates than 5.9 percent nationally and 12.3 percent in the urban areas. In a similar vein, non-corporate establishment (i.e., non-OAE) enterprises have grown 9.8 percent nationally. While the largest enterprises have grown significantly more rapidly than the rest, once we get past the OAE, smaller service

enterprises have managed to do well, too. As such the real issue with respect to transformation of the economy concerns the OAE that employ more than half of the services workforce.

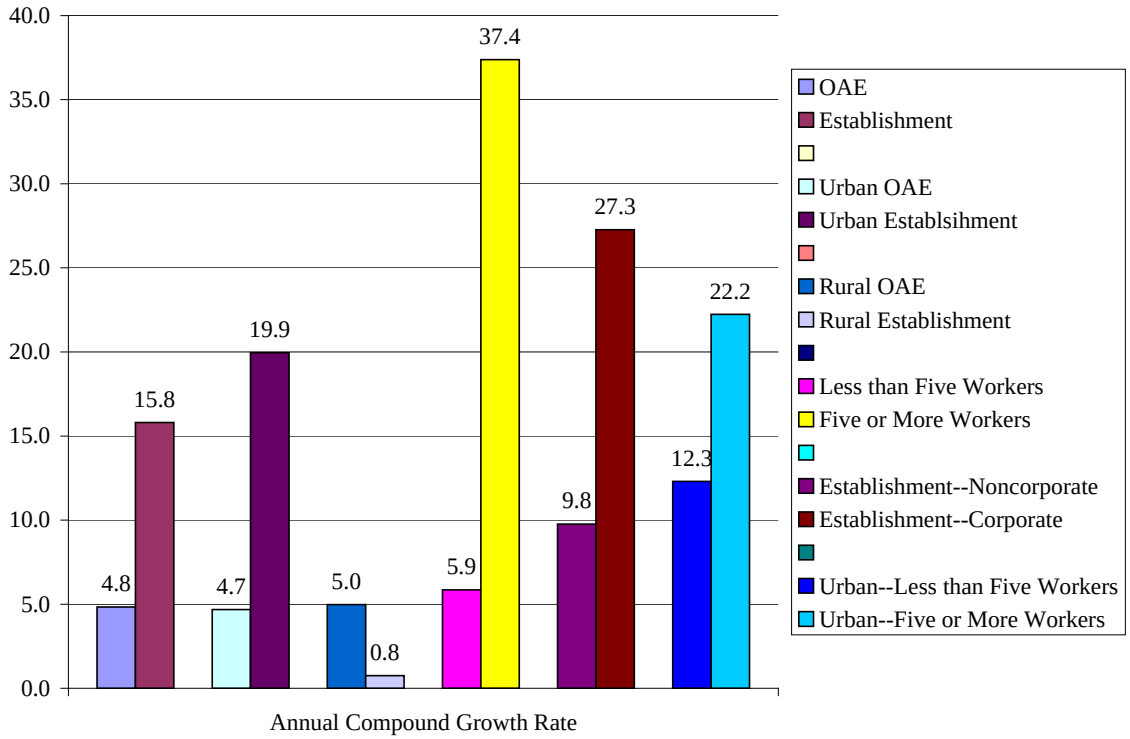

Figure 1: Small and Large Enterprises Compared on All-India Basis

It may be asked whether the significantly lower growth in the OAE might not represent a general shift away from these enterprises and towards establishment enterprises. In other words, despite high productivity growth, these enterprises may show low overall growth due to shift into establishment enterprises. While there is evidence suggesting a shift in this direction—the share of the OAE in services significantly fell in 2006-07 relative to 2001-02—the OAE remain subject to relatively low average productivity. This feature can be illustrated through the data on growth in the average value added per worker and per enterprise. These latter are shown in Figure 2. The nominal value added per enterprise in the establishment enterprises grew at more than six

times the annual rate exhibited by the OAE. Similarly, the nominal value added per worker in the establishment enterprises grew almost five times faster than in the OAE. No matter how we look at it, the performance of the large enterprises remains distinctly superior to that of smaller enterprises.

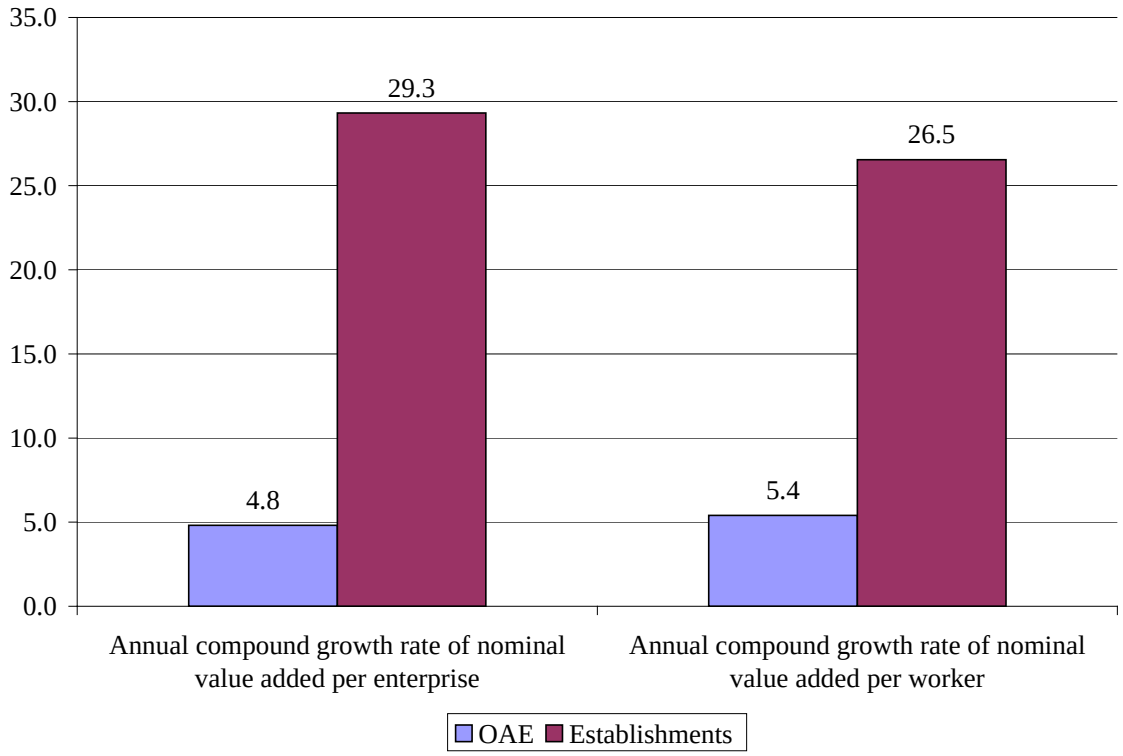

Figure 2: Nominal Value Added Per Enterprise and Per Worker

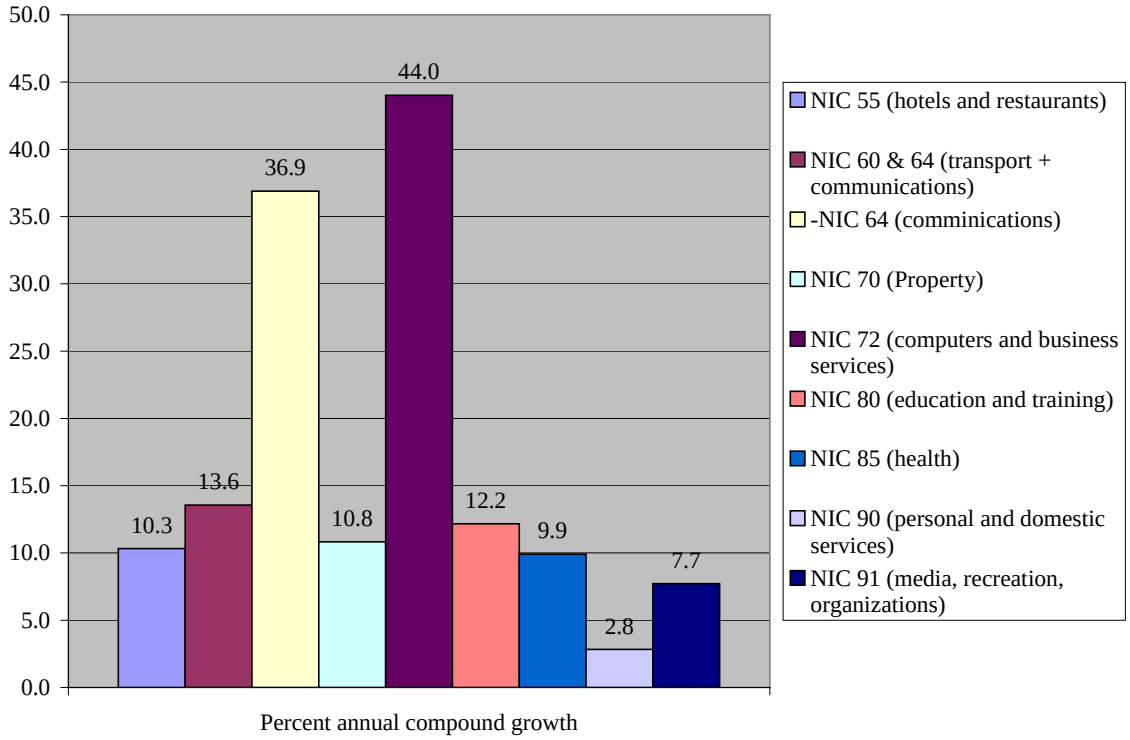

Figure 3: Annual Growth rates in Selected Sectors

Next, we consider the growth rates across some of the selected sectors. These are shown in Figure 3. Unsurprisingly, among the sectors shown, computer and business services, which include the software industry, and communications, which reflect the spread of the cell phone, exhibited the fastest growth. Going by the surveys, these sectors grew at gigantic compound rates of 44 and 36.9 percent per annum, respectively. Given these sectors contain some very large corporations, the bias due to better coverage of the list frame enterprises in the 2006-07 survey leads to some overstatement of their growth. But even if we attribute an unrealistically high ten-percentage-points growth to this bias, the sectors have grown at most impressive annual rates. Among other sectors, real estate, education and health have exhibited double-digit or near-double-digit growth rates.

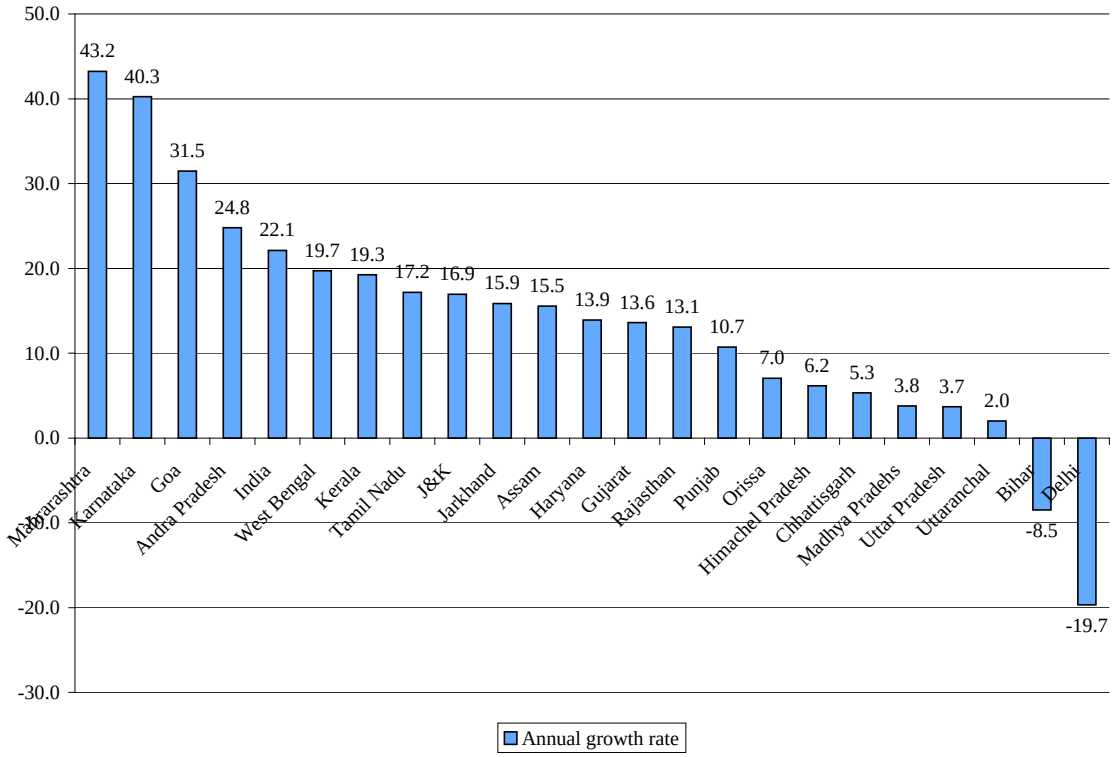

Figure 4: Annual Growth Rates Across States

Finally, we consider growth rates across states. For this purpose, we concentrate on 23 largest states, excluding Sikkim, the six northeastern states carved out of Assam and the UTs. Figure 4 depicts the growth rates across the states. Maharashtra and Karnataka, which are the two largest states in terms of service output, also exhibit the highest growth in services. Andhra Pradesh, which is also large in services, ranks fourth. To some degree, the story of growth in services in India may well be the story of growth in services in these three states. Ten additional states have shown double-digit growth in these services but they are all below the national average. The state with most workers in the covered services—Uttar Pradesh—did poorly, exhibiting just 3.7 percent annual growth rate. For reasons not clear to us, two states—Delhi and Bihar—exhibited negative growth in the services covered in the surveys.

7. Productivity Growth

The analysis in the previous section focuses entirely on growth. The survey data include information on various inputs used by the enterprises and can be used to estimate productivity growth between the two survey years. We warn, however, that as usual, we must work with some variables in *value* terms rather than physical quantities, which poses an interpretation problem. To make this point explicit, the conventional production function is written:

(1) $X(t) = A(t)[K(t)]^{\alpha}[L(t)]^{\beta}[M(t)]^{\gamma}$

Here X stands for output, K for capital, L for labor, M for intermediate inputs and t for time. Term A(t) measures the level of productivity. Letting P_X, P_K and P_M stand for the price of X, K and M, respectively, we can rewrite this equation as:

(2) $$P_X(t)X_X(t) = \frac{P_X(t)A(t)}{[P_K(t)]^{\alpha}[P_M(t)]^{\gamma}}[P_K(t)K(t)]^{\alpha}[L(t)]^{\beta}[P_M(t)M(t)]^{\gamma}$$

Letting V stand for value, this equation can be rewritten as

(3) $$V_X(t) = \frac{P_X(t)A(t)}{[P_K(t)]^{\alpha}[P_M(t)]^{\gamma}}[V_K(t)]^{\alpha}[L(t)]^{\beta}[V_M(t)]^{\gamma}$$

A long-recognized difficulty in estimating equation (3) is that any time-invariant firm-level unobservable input (for example, managerial skill) will be absorbed into $A(t)$. A standard solution is to use longitudinal data: two (or more) observations per firm allow us to difference out the firm fixed effect: taking logs on both sides and differentiating with respect to time, we obtain:

(4) $$\hat{V} = \hat{A} + [\hat{P}_X - (\alpha \hat{P}_K + \gamma \hat{P}_M)] + \alpha \hat{V}_K + \beta \hat{L} + \gamma \hat{V}_M$$

Here we use "^" over a variable to denote the proportionate change in that variable. Because we use output values at constant prices, we can think of P_X as being constant, i.e., $\hat{P}_X = 0$. This means that productivity growth, which equals $\hat{A}$, would be underestimated by the weighted sum of the proportionate change in the prices of capital and intermediate input prices. Unfortunately the NSS data provide us with repeated cross-sections of firms rather than a panel. Consequently we create a panel of synthetic firms by collapsing the data into cells defined by 2-digit NIC, state, and survey round, which yields 578 state-year-2-digit-NIC observations. Thus, we are assuming that in a given state, year, and a 2-digit industry firms use identical technology.

A further challenge in estimating the production function is that unobserved productivity shocks are likely to lead both to increased output and input use. A number of solutions to this simultaneity have been proposed in the recent literature. We implement the Levinsohn and Petrin (2003) estimator, which uses intermediate inputs as proxies for productivity shocks, as intermediate inputs are more likely to respond simultaneously and smoothly to unobserved productivity shocks.

Finally, it is important to note that our estimates of total and TFP growth correspond to the average growth in value added at the industry-state level, rather than the growth in the total value added across all industries. To the extent that growth is highly skewed across industries our estimates of average growth at the industry-state level will tend to be lower than the growth in total value added.

In Figure 5, we break productivity growth down into factor growth and TFP growth, with the sum of the two categories corresponding to total growth. India-wide, TFP growth is 18 percentage points out of a total growth in services of 31 percent; hence

productivity growth explains approximately 60 percent of total growth. With a few exceptions, the fastest growing states are similar to Figure 3, namely Maharashtra, Karnataka, Goa, and Andhra Pradesh, with total growth ranging from almost 80 percent to just over 40 percent and TFP accounting for 20 percent or more of growth.

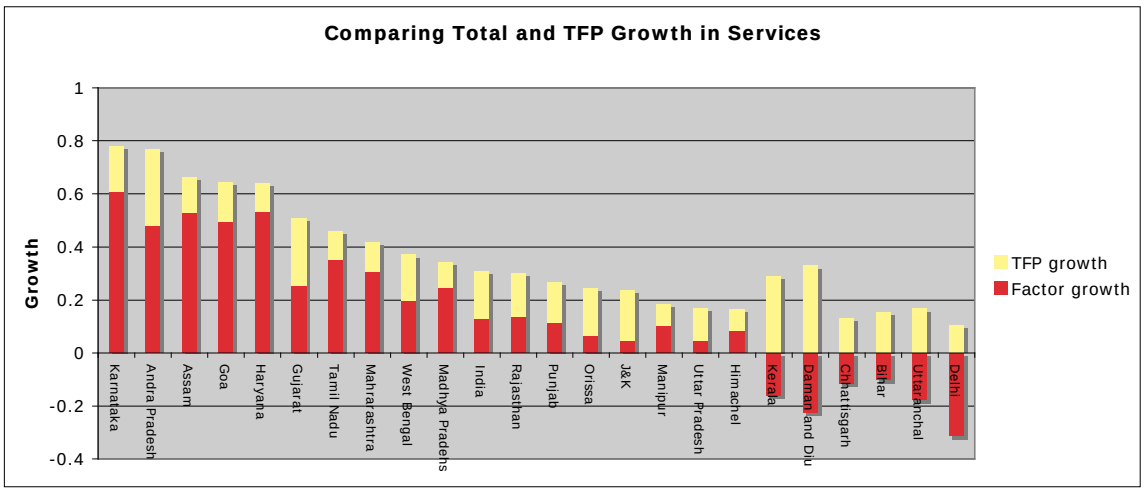

Figure 5: Contribution of Productivity Growth to the Total Industry-State Growth in Services in 22 Large States based on Levinsohn-Petrin Estimator

According to Figure 5, as one would expect, the contribution of TFP growth varies considerably across states. An interesting feature of the numbers is that in states where the value added has grown rapidly, the relative contribution of TFP growth is low. In contrast, productivity growth makes a much large contribution in states such as Rajasthan, Orissa, and J&K, where overall growth has been low. One speculative interpretation of these results is that TFP growth tends to be highest in states where the service sector was relatively undeveloped as of 2001-2002.

A potentially important element of TFP in India has been the shift within the service sector to fast-growing industries. In Figure 5 this would be subsumed within our TFP estimates; this is appropriate in the sense that shifts to more productive activities are a

legitimate increase in factor productivity. Nonetheless, it is interesting to consider how factor productivity has increased within industry, as this is more likely to capture actual technological improvements. The results presented in Figure 6 show that predictably this reduces the contribution of productivity gains, though it still remains substantial, especially in some of the states, and underlines our view that TFP growth is a significant part of the story of the growth in services.

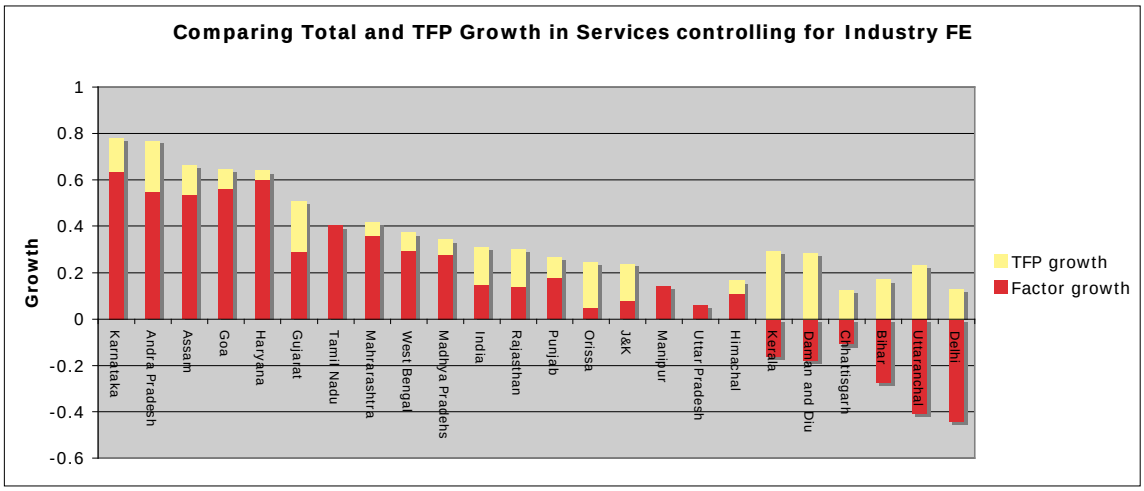

Figure 6: Contribution of Productivity Growth to the Total Industry-State Growth in Services in 22 Large States based on Levinsohn-Petrin Estimator Corrected for Industry Fixed Effects

We conclude this section with the observation that no matter how we estimate it productivity growth remains a far greater proportion of the predicted growth for most states than commonly observed. This result cannot be attributed to the upward bias in measurement due to the better capture of the data for the large, list frame enterprises. This is because such bias must impact not just output but input usage as well. Our own hypothesis is that the large contribution is due to more effective utilization of labor. We noted in the introduction that prior to liberalization, the services sector in India operated like a subsistence economy in the 19th century in the sense that it had large volumes of

underutilized labor. As liberalization proceeded and the demand for services grew, this labor came to be utilized more and more fully.

8. Explaining Growth in Services

In this section, we move beyond the stylized facts of service sector growth and attempt to test the two hypotheses regarding the causes of this growth that we outlined in the introduction. To review briefly, a puzzling fact about the service sector is that it experienced rapid growth coinciding with external liberalization and internal deregulation, even though services were relatively free of external dependence and onerous internal regulation. Our two hypotheses are: (i) Growth in the manufacturing sector created demand for services, both directly for services used by manufacturing and indirectly by increasing incomes and hence consumer demand; and (ii) External liberalization allowed for access to inputs along both quality and price dimensions (e.g., computers and software for business consulting).

In order to test these hypotheses we use three sources of variation, in addition to the NSS data on services and manufacturing. First, we use an index of labor flexibility by states from Hasan, Mitra, and Ramaswamy (2007), modified from Besley and Burgess (2002). This index assumes a value of 1 for states with a flexible, employer-friendly labor market regime and 0 otherwise. Since this index is based on state-level labor laws that are *de jure* relevant to manufacturing, we hypothesize that its primary impact on services will be indirect, through manufacturing. Second, we use an indicator for capital-intensive service sector industries to test whether services growth is higher in capital-intensive services than non-capital-intensive services since the former are more dependent on availability of inputs such as computers, machines and automobiles (whose

supply the domestic and import liberalization have helped relax) than the latter (which rely more on labor and land). We code transport, computer services, and media as capital intensive, and restaurants, property, education, health, and personal services as non-capital-intensive. Third, we use Ghosh and De's (2004) Financial Development and Infrastructure Index, which is an indicator coded as 1 for states that exceed a minimum threshold of financial development. The hypothesis here is that if liberalization benefits capital-intensive services specifically by relaxing their credit constraints, then we would expect to see financial-development benefit capital intensive industries more than non-capital-intensive services.

Our specifications are of the form:

$$y_{it} = \alpha + \tau T_t + \beta X_{it} + \varepsilon_{it},$$

where we stack the observations from rounds 57 and 63, with i representing firms and t survey rounds. Variable y_{it} represents gross value added in logs, T_t is an indicator for round 63, and the X_{it} are a set of explanatory variables that vary by column. In some specifications, we also include state fixed effects.

Our results are presented in Table 8. Column 1 presents a reduced-form specification of log gross value added against labor regulations. Consistent with our first hypothesis, we find that liberal labor regulations are associated with positive growth in services, although this effect is not statistically significant. If the effect of labor regulations is specifically through manufacturing, we would expect the growth in services to be concentrated in locations where manufacturing takes place (i.e. in cities) and in enterprises that are most likely to service manufacturing firms (i.e., larger enterprises with 5 or more workers). In columns 2 to 4 we split the sample into small enterprises,

large rural enterprises, and large urban enterprises, and find a negligible impact in small service firms, a large but insignificant impact in large rural enterprises, and a large, significant relationship in larger urban enterprises.

Presumably labor regulations are picking up exogenous variation in manufacturing activity. This raises the question of whether there is a further effect of manufacturing growth on services, above and beyond what we are picking up through labor regulations. In column 5, we find a small, positive, but insignificant direct effect. This has two possible interpretations: labor regulations are picking up the most important variation in manufacturing that is relevant for services and/or manufacturing is simultaneously determined with services through local productivity and demand shocks and so labor regulations capture the cleanly exogenous part of this variation.

To the extent that labor regulations are exogenous with respect to services (which *de facto* they appear to be) and affect services only through manufacturing (which is true *de jure* and is suggested by columns 2 to 4), we can use them as an instrumental variable for manufacturing. The resulting estimates are presented in column 6. The first stage t-statistic for labor regulations is 35, and the second-stage effect of manufacturing on services is positive and significant at the 10 percent level: a one percent increase in manufacturing growth leads to a half-percent increase in service sector growth.

Although instrumental variables provide an intuitive interpretation of the relationship between manufacturing and services, we believe that the identifying assumptions are strong. In particular the exclusion restriction seems *a priori* implausible: even if liberal labor regulations had a zero impact on manufacturing growth, they could affect the service sector through other channels, such as the labor market.

Hence, in columns 7 and 8, we extend our instrumental variables specification by allowing labor regulations to have a direct impact on services, by using the interaction between the initial level of manufacturing in 1987 and labor regulations as the instrumental variable for manufacturing growth, and by including state fixed effects. The specification now allows labor regulations to affect services growth both directly and through manufacturing, and also controls for the impact of the initial level of manufacturing in 1987 and of other time-invariant state characteristics (such as business friendliness) on subsequent growth though the state fixed effect. Our identifying assumption is now that the extra growth experienced by states with employer-friendly labor regulations in states with high initial levels of manufacturing in 1987 affect services growth only through manufacturing growth. In column 7, we find a significant first-stage effect of the instrument, and in column 8 we find a positive and significant second-stage effect of manufacturing growth. A percentage point increase in manufacturing growth boosts service growth by 0.2 percentage points. We note that employer-friendly labor regulations continue to have a positive and significant direct effect. Given the inclusion of state fixed effects and the use of instrumental variables, we believe this provides strong evidence in favor of our hypothesis that services growth was linked to growth in manufacturing.

In columns 9 and 10, we test the second hypothesis through two variables: financial sector development and capital intensity of services. In column 9, the financial development indicator has a positive effect but it is not statistically significant. It is also noteworthy that including the financial development indicator kills off the direct effect of labor regulations, although not the indirect effect of labor regulations through

manufacturing growth, since the latter effect is essentially unchanged in magnitude and significance. In column 10, we include the capital-intensity variable and a term capturing the interaction between it and the financial development variable. The capital-intensity variable is associated with a positive and statistically significant effect. As hypothesized, growth in capital-intensive services is higher than non-capital intensive services; this is consistent with liberalization asymmetrically benefiting capital-intensive services by making the inputs available at lower cost. The interaction effect is positive, which suggests the possibility that financial development further helps the capital-intensive services by relaxing the credit constraint. However, the interaction is not statistically significant, so the evidence in favor of liberalization benefiting capital-intensive services through the financial channel is weaker than for inputs becoming available more freely and more cheaply to all service industries.

Overall, our empirical results lend credence to both of our hypotheses: there is systematic evidence that growth in the manufacturing sector partially passes to the service sector. And at least one of our variables, capital intensity of services, suggests that liberalization has helped the growth of the services dependent on tradable inputs. There is also weak evidence that the ability to borrow – specifically, in capital-intensive service sector activities – leads to faster service sector growth.

Table 8: Explaining Growth in the Service Sector

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Full sample	< 5 workers	> 5 workers and rural	> 5 workers and urban	> 5 workers and urban	> 5 workers and urban	Manufacturing growth	> 5 workers and urban	> 5 workers and urban	> 5 workers and urban
VARIABLES						IV	First stage	IV & state FE	IV & state FE	IV & state FE
Employer-friendly labor regulations	0.116	0.025	0.331	0.511**	0.493**		-5.594***	0.458***	-0.026	-0.028
	[0.154]	[0.127]	[0.357]	[0.180]	[0.176]		[0.114]	[0.077]	[0.046]	[0.045]
Manufacturing growth					0.019	0.53*		0.205**	0.205**	0.198**
					[0.037]	[0.32]		[0.094]	[0.094]	[0.091]
Financial development (Ghosh-De) indicator									0.032	0.013
									[0.021]	[0.028]
Capital intensive sector										0.390***
										[0.060]
Capital intensive sector x Financial developme										0.095
										[0.082]
Nss Round 63	-0.233***	-0.198***	-1.454***	0.408**	0.247	-4.015	6.710***	-1.296	-1.296	-1.233
	[0.059]	[0.058]	[0.301]	[0.166]	[0.269]	[3.047]	[1.350]	[0.904]	[0.904]	[0.875]
Constant	10.348***	10.196***	11.677***	12.164***	12.173***	12.400***	5.543***	11.964***	12.416***	12.325***
	[0.065]	[0.060]	[0.218]	[0.087]	[0.088]	[0.103]	[0.382]	[0.062]	[0.044]	[0.042]
Labor regulation x Manufacturing in 1987							0.783**			
							[0.320]			
Observations	457,021	417,174	10,390	29,457	29,457	29,457	29,712	29,457	29,457	29,457
F-test for IV						3.14	6.00	6.00	6.00	6.00

Notes: Standard errors are clustered at the state level. Regressions include the 15 largest states: Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. *** p<0.01, ** p<0.05, * p<0.

9. Concluding Remarks

In this paper, we have taken a first stab at the analysis of growth in services in India using firm level data. For this purpose, we have used the data collected by the NSSO during 2001-02 and 2006-07 employing broadly comparable sample design. The main variation in the sample design is that the second survey makes a special effort to capture the output of the largest enterprises, which turn out to contribute as much as 38 percent of the total services output of services covered by that survey. Because the output of these same enterprises was not captured as well in the first survey, the absolute growth in services implied by the two surveys is very likely biased upward.

Nevertheless, the surveys offer the first glimpse into the performance of enterprises of different size. In these concluding remarks, we wish to emphasize four main findings. First, while the services output is heavily concentrated in the urban establishment enterprises, more than half of the workers are employed in on account enterprises, which do not employ any hired workers at all. If we included enterprises with less than five workers among smaller enterprises, the contrast between the concentration of output and workers in large and small enterprises turns even stronger. The smaller enterprises, no matter how we choose to define them, exhibit much lower output per worker, output per enterprise and growth in output over time than larger enterprises. This means that the transformation to a modern economy would require not just the movement of workers from agriculture to industry as the second author has emphasized in a number of his writings (for example, see Panagariya 2008a, 2008b) but also a movement of workers from the smaller to larger services enterprises or, alternatively and minimally, modernization of on account enterprises.

Second, services output and growth is highly concentrated in a handful of the states. Maharashtra and Karnataka alone account for almost half of the services output covered by the second survey, which includes financial sector services. These same states also account for by far the highest growth in the services common to the two surveys. In contrast, Uttar Pradesh accounts for the most workers in the services covered in the second survey but it ranks eighth in terms of output value. Prima facie, leading states such as Maharashtra and Karnataka exhibit higher output per worker in services than lagging states such as Uttar Pradesh.

Third, our calculations suggest very substantial contribution of productivity growth to overall growth in services. This finding is consistent to some degree with that of Bosworth et al. (2006-07), who undertake a growth accounting exercise across agriculture, industry and services at the national level using macroeconomic data and find a much larger contribution of productivity growth in services than in industry. Our calculations yield annual compound productivity growth rates of 3 percent or more in a number of states, with Kerala and Andhra Pradesh exhibiting rates as high as 5.2 percent per annum. Given the dominant role of services in India's growth, these findings suggest that its growth has relied less on factor accumulation and more on productivity improvements. We have hypothesized that the productivity growth has resulted at least in part from more effective use of previously underutilized labor.

Finally, we address ourselves to the puzzle that service sector growth in India took off only after external liberalization and internal deregulation, despite the fact that these factors were not a direct restraint on the service sector. We offer two hypotheses to explain this phenomenon: growth in manufactures, which depended on the liberalization,

increased the demand for many services directly as well as through increased expenditures; and opening up improved the access to tradable inputs used in services. We find strong support for the first hypothesis, and at least some suggestive support for the second. Growth in the manufacturing sector significantly passes through to the service sector. We also find that the capital-intensive services, which asymmetrically depend on tradable inputs, have grown more rapidly than other services that do not depend on these inputs. Additionally, more developed financial sector leads to faster service sector growth, particularly in capital-intensive service sector activities, but this effect is not statistically significant.

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Appendix

Table A.1: NIC 2004 Two-digit Classification

Sections/Divisions	Description
Section A:	Agriculture, hunting and forestry
Division 01:	Agriculture, hunting and related service activities
Division 02:	Forestry, logging and related service activities
Section B:	Fishing
Division 05:	Fishing, aquaculture and service activities incidental to fishing
Section C:	Mining and quarrying
Division 10:	Mining of coal and lignite; extraction of peat
Division 11:	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction
Division 12:	Mining of uranium and thorium ores
Division 13:	Mining of metal ores
Division 14:	Other mining and quarrying
Section D:	Manufacturing
Division 15:	Manufacture of food products and beverages
Division 16:	Manufacture of tobacco products
Division 17:	Manufacture of textiles
Division 18:	Manufacture of wearing apparel; dressing and dyeing of fur
Division 19:	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear

Division 20:	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
Division 21:	Manufacture of paper and paper products
Division 22:	Publishing, printing and reproduction of recorded media
Division 23:	Manufacture of coke, refined petroleum products and nuclear fuel
Division 24:	Manufacture of chemicals and chemical products
Division 25:	Manufacture of rubber and plastics products
Division 26:	Manufacture of other non-metallic mineral products
Division 27:	Manufacture of basic metals
Division 28:	Manufacture of fabricated metal products, except machinery and equipment
Division 29:	Manufacture of machinery and equipment not elsewhere classified
Division 30:	Manufacture of office, accounting and computing machinery
Division 31:	Manufacture of electrical machinery and apparatus not elsewhere classified
Division 32:	Manufacture of radio, television and communication equipment and apparatus
Division 33:	Manufacture of medical, precision and optical instruments, watches and clocks
Division 34:	Manufacture of motor vehicles, trailers and semi-trailers
Division 35:	Manufacture of other transport equipment
Division 36:	Manufacture of furniture; manufacturing not elsewhere classified

Division 37:	Recycling
Section E:	Electricity, gas and water supply
Division 40:	Electricity, gas, steam and hot water supply
Division 41:	Collection, purification and distribution of water
Section F:	Construction
Division 45:	Construction
Section G:	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
Division 50:	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
Division 51:	Wholesale trade and commission trade, except of motor vehicles and motorcycle
Division 52:	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods
Section H:	Hotels and restaurants
Division 55:	Hotels and restaurants
Section I:	Transport, storage and communications
Division 60	: Land transport; transport via pipelines
Division 61:	Water transport
Division 62:	Air transport
Division 63:	Supporting and auxiliary transport activities; activities of travel agencies
Division 64:	Post and telecommunications

Section J:	Financial intermediation
Division 65:	Financial intermediation, except insurance and pension funding
Division 66:	Insurance and pension funding, except compulsory social security
Division 67:	Activities auxiliary to financial intermediation
Section K:	Real estate, renting and business activities
Division 70:	Real estate activities
Division 71:	Renting of machinery and equipment without operator and of personal and household goods
Division 72:	Computer and related activities
Division 73:	Research and development
Division 74:	Other business activities
Section L:	Public administration and defense; compulsory social security
Division 75:	Public administration and defense; compulsory social security
Section M:	Education
Division 80:	Education
Section N:	Health and social work
Division 85:	Health and social work
Section O:	Other community, social and personal service activities
Division 90:	Sewage and refuse disposal, sanitation and similar activities
Division 91:	Activities of membership organizations not elsewhere classified
Division 92:	Recreational, cultural and sporting activities
Division 93:	Other service activities

Section P:	Activities of private households as employers and undifferentiated production activities of private households
Division 95:	Activities of private households as employers of domestic staff
Division 96:	Undifferentiated goods-producing activities of private households for own use
Division 97:	Undifferentiated service-producing activities of private households for own use
Section Q:	Extraterritorial organizations and bodies
Division 99:	Extraterritorial organizations and bodies

Source: Ministry of Statistics and Program Implementation